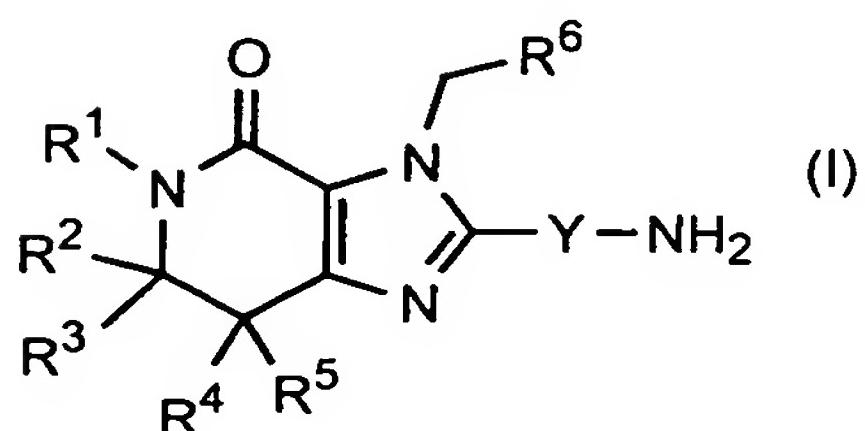


CLAIMS

1. A compound represented by the formula (I):



wherein R¹ is a hydrogen atom, an optionally substituted alkyl group, an optionally substituted cycloalkyl group, an optionally substituted aryl group, or an optionally substituted heteroaryl group;

R² and R³ are independently a hydrogen atom, a halogen atom, a cyano group, a formyl group, an optionally substituted alkyl group, an optionally substituted cycloalkyl group, an optionally substituted cycloalkyloxy group, an optionally substituted alkenyl group, an optionally substituted alkynyl group, an optionally substituted amino group, an optionally substituted carbamoyl group, a carboxyl group, an optionally substituted alkoxy group, an optionally substituted alcoxycarbonyl group, an optionally substituted aryl group, an optionally substituted aryloxy group, an optionally substituted aryloxycarbonyl group, an optionally substituted aralkyl group, an optionally substituted aralkyloxy group, an optionally substituted aroyl group, an optionally substituted arylthio group, an optionally substituted arylsulfinyl group, an optionally

substituted arylsulfonyl group, an optionally substituted alkylthio group, an optionally substituted alkylsulfinyl group, an optionally substituted alkylsulfonyl group, an optionally substituted heteroaryl group, an optionally substituted heteroarylalkyl group, an optionally substituted heteroarylcarbonyl group, an optionally substituted heteroaryloxy group, an optionally substituted alkylcarbonyl group, an optionally substituted nitrogen-containing saturated heterocyclic group, an optionally substituted aralkyloxycarbonyl group, an optionally substituted cycloalkyloxycarbonyl group, a tetrahydrofuranyloxycarbonyl group, a cinnamyloxycarbonyl group, or a group represented by the formula: $-C(O)OCH(R^{18})OC(O)R^{19}$ wherein R^{18} is a hydrogen atom, an alkyl group, an alkenyl group, a cycloalkyl group or an alkoxy group, and R^{19} is an optionally substituted alkyl group, an optionally substituted alkenyl group, a cycloalkyl group, a cycloalkyloxy group, an optionally substituted alkoxy group, an optionally substituted alkenyloxy group, a 2-indanyloxy group, a 5-indanyloxy group or an optionally substituted aryloxy group, or R^2 and R^3 may be taken together to form an oxo group on the ring;

R^4 and R^5 are independently a hydrogen atom, a halogen atom, an optionally substituted alkyl group or an alkoxycarbonylmethyl group;

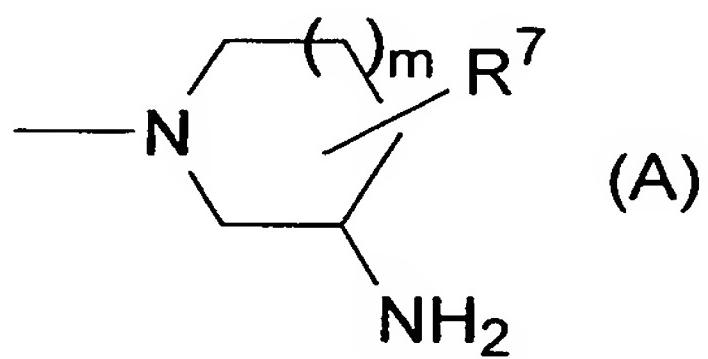
R^3 and R^5 may be taken together to form a

double bond on the ring;

R^2 , R^3 , R^4 and R^5 may form an optionally substituted benzene ring, an optionally substituted cycloalkene ring or an optionally substituted 5-or 6-membered heteroaromatic ring together with the adjacent carbon atoms;

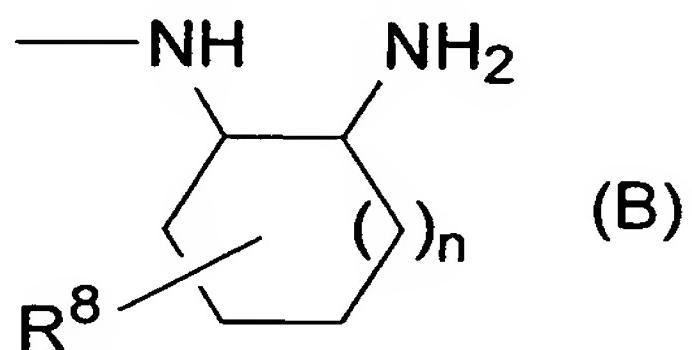
R^6 is a hydrogen atom, an optionally substituted alkyl group, an optionally substituted cycloalkyl group, an optionally substituted aryl group, an optionally substituted vinyl group, an optionally substituted nitrogen-containing saturated heterocyclic group or an optionally substituted heteroaryl group; and

$-Y-NH_2$ is a group represented by the following formula (A) or a group represented by the following formula (B):



wherein m is 0, 1 or 2, and R^7 is absent or one or two R^7 's are present and are independently a halogen atom, a hydroxyl group, an oxo group, an optionally substituted alkoxy group, an optionally substituted alkyl group, an optionally substituted aryl group, an optionally substituted aralkyl group, an optionally substituted amino group, a carboxyl group, an optionally

substituted alkoxy carbonyl group or an optionally substituted carbamoyl group, or two R⁷'s, when taken together, represent methylene or ethylene and may bind to two carbon atoms constituting the ring, to form a new ring, or



wherein n is 0, 1 or 2, and R⁸ is absent or one or two R⁸'s are present and are independently a halogen atom, a hydroxyl group, an oxo group, an optionally substituted alkoxy group, an optionally substituted alkyl group, an optionally substituted aryl group, an optionally substituted aralkyl group, an optionally substituted amino group, a carboxyl group, an optionally substituted alkoxy carbonyl group or an optionally substituted carbamoyl group, or two R⁸'s, when taken together, represent methylene or ethylene and may bind to two carbon atoms constituting the ring, to form a new ring,

a prodrug of said compound, or a pharmaceutically acceptable salt of said compound or prodrug.

2. A compound, a prodrug thereof or a pharmaceutically acceptable salt of the compound or prodrug according to claim 1, wherein -Y-NH₂ is a group represented by the formula (A) and m is 1 or 2, or -Y-

NH₂ is a group represented by the formula (B) and n is 1 or 2.

3. A compound, a prodrug thereof or a pharmaceutically acceptable salt of the compound or prodrug according to claim 1 or 2, wherein R² and R³ are taken together to form an oxo group on the ring.

4. A compound, a prodrug thereof or a pharmaceutically acceptable salt of the compound or prodrug according to claim 1 or 2, wherein R³ and R⁵ are taken together to form a double bond on the ring.

5. A compound, a prodrug thereof or a pharmaceutically acceptable salt of the compound or prodrug according to claim 1 or 2, wherein R², R³, R⁴ and R⁵ form an optionally substituted benzene ring, an optionally substituted cycloalkene ring or an optionally substituted 5-or 6-membered heteroaromatic ring together with the adjacent carbon atoms.

6. A compound, a prodrug thereof or a pharmaceutically acceptable salt of the compound or prodrug according to claim 4, wherein R² is a hydrogen atom, a cyano group, an optionally substituted alkyl group, a carboxyl group, an optionally substituted alkoxy group, an optionally substituted alkoxy carbonyl group, an optionally substituted cycloalkyloxycarbonyl group, an optionally substituted aryl group, an optionally substituted heteroaryl group, an optionally substituted aryloxy group, an optionally substituted aryloxycarbonyl group, an optionally substituted

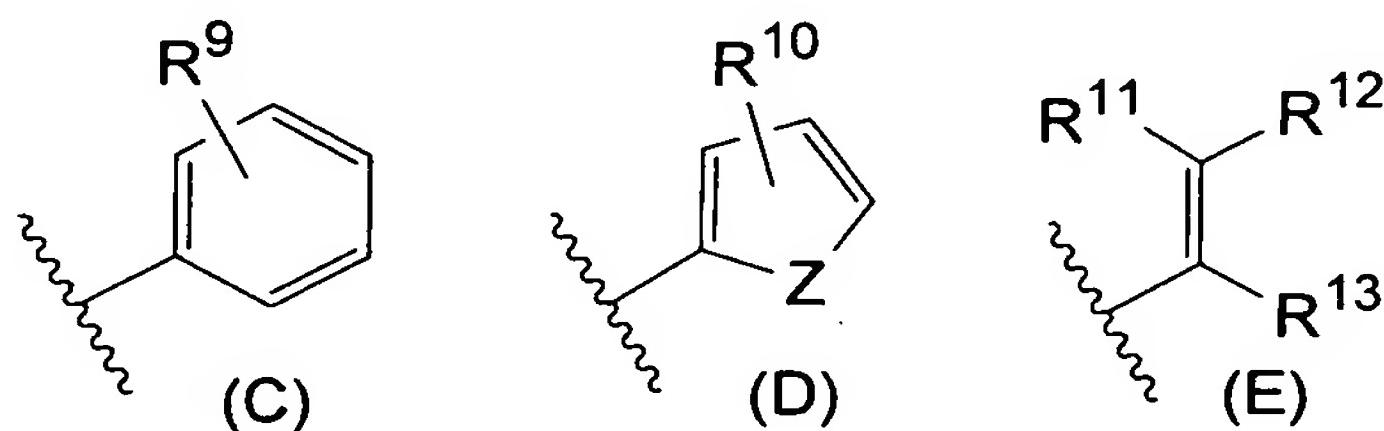
aralkyl group, an optionally substituted aralkyloxy group, an optionally substituted aroyl group, an optionally substituted alkylcarbonyl group, a tetrahydrofuranyloxycarbonyl group, a cinnamyloxycarbonyl group, or a group represented by the formula: $-C(O)OCH(R^{18})OC(O)R^{19}$ wherein R^{18} and R^{19} are as defined in claim 1.

7. A compound, a prodrug thereof or a pharmaceutically acceptable salt of the compound or prodrug according to claim 4, wherein R^4 is a hydrogen atom or a methyl, ethyl or alkoxycarbonylmethyl group.

8. A compound, a prodrug thereof or a pharmaceutically acceptable salt of the compound or prodrug according to claim 4, wherein R^2 is a hydrogen atom, a cyano group, an optionally substituted alkyl group, a carboxyl group, an optionally substituted alkoxy group, an optionally substituted alkoxycarbonyl group, an optionally substituted cycloalkyloxycarbonyl group, an optionally substituted aryl group, an optionally substituted heteroaryl group, an optionally substituted aryloxy group, an optionally substituted aryloxycarbonyl group, an optionally substituted aralkyl group, an optionally substituted aralkyloxy group, an optionally substituted aroyl group, an optionally substituted alkylcarbonyl group, a tetrahydrofuranyloxycarbonyl group, a cinnamyloxycarbonyl group, or a group represented by the formula: $-C(O)OCH(R^{18})OC(O)R^{19}$ wherein R^{18} and R^{19} are

as defined in claim 1; and R⁴ is a hydrogen atom or a methyl, ethyl or alkoxy carbonylmethyl group.

9. A compound, a prodrug thereof or a pharmaceutically acceptable salt of the compound or prodrug according to any one of claims 1 to 8, wherein R⁶ is a group represented by the following formula (C), (D) or (E) :



wherein Z is an oxygen atom, -S(O)p or -N(R¹⁴)-,

R⁹ is absent or one or two R⁹'s are present and are independently a halogen atom, a hydroxyl group, a formyl group, a carboxyl group, a cyano group, an alkylthio group, an alkylsulfinyl group, an alkylsulfonyl group, an alkyl group, a haloalkyl group, a cycloalkyl group, an alkoxy group, a haloalkoxy group, an optionally substituted amino group, an optionally substituted carbamoyl group, an alkoxy carbonyl group, an optionally substituted alkylcarbonyl group, a cycloalkylcarbonyl group, an optionally substituted aryl group, or an optionally substituted heteroaryl group, or two R⁹'s, when taken together, represent a C₁₋₃ alkylenedioxy group,

R¹⁰ is absent or one or two R¹⁰'s are present and are independently a halogen atom, a cyano group, an

alkyl group, a haloalkyl group, a cycloalkyl group, an alkoxy group or a haloalkoxy group,

R¹¹ is methyl, ethyl, a chlorine atom or a bromine atom,

R¹² is a hydrogen atom, methyl, ethyl, a chlorine atom or a bromine atom,

R¹³ is a hydrogen atom, methyl or ethyl,

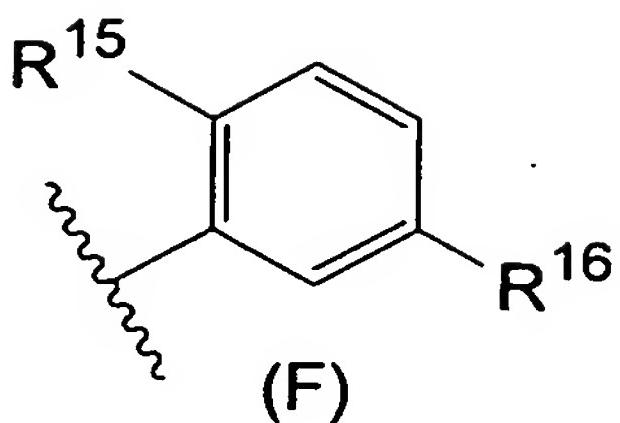
p is 0, 1 or 2, and

R¹⁴ is a hydrogen atom or an alkyl group.

10. A compound, a prodrug thereof or a pharmaceutically acceptable salt of the compound or prodrug according to claim 9, wherein R⁶ is the formula (C) or the formula (E).

11. A compound, a prodrug thereof or a pharmaceutically acceptable salt of the compound or prodrug according to claim 10, wherein R⁶ is the formula (C), and R⁹ is absent or one or two R⁹'s are present and are independently a halogen atom, a cyano group, an alkylthio group, an alkylsulfonyl group, a C₁₋₃ alkylenedioxy group, an alkyl group, a haloalkyl group, a cycloalkyl group, an alkoxy group, a haloalkoxy group, an alkoxycarbonyl group, an alkylcarbonyl group, a haloalkylcarbonyl group or a cycloalkylcarbonyl group.

12. A compound, a prodrug thereof or a pharmaceutically acceptable salt of the compound or prodrug according to any one of claims 1 to 8, wherein R⁶ is the following formula (F):



wherein R^{15} is a halogen atom, a cyano group, an alkyl group, a haloalkyl group, a cycloalkyl group, an alkoxy group or a haloalkoxy group, and R^{16} is a hydrogen atom or a fluorine atom.

13. A compound, a prodrug thereof or a pharmaceutically acceptable salt of the compound or prodrug according to any one of claims 1 to 12, wherein R^1 is a hydrogen atom or an optionally substituted alkyl group of 1 to 3 carbon atoms whose substituent(s) is selected from fluorine atom, optionally substituted aroyl groups, carboxyl group, optionally substituted alkoxycarbonyl groups, optionally substituted aryl groups and optionally substituted aryloxy groups.

14. A compound, a prodrug thereof or a pharmaceutically acceptable salt of the compound or prodrug according to any one of claims 1 to 12, wherein R^1 is a group represented by the formula: $-Ra-Rb-Rc$ in which

Ra is an alkylene chain,

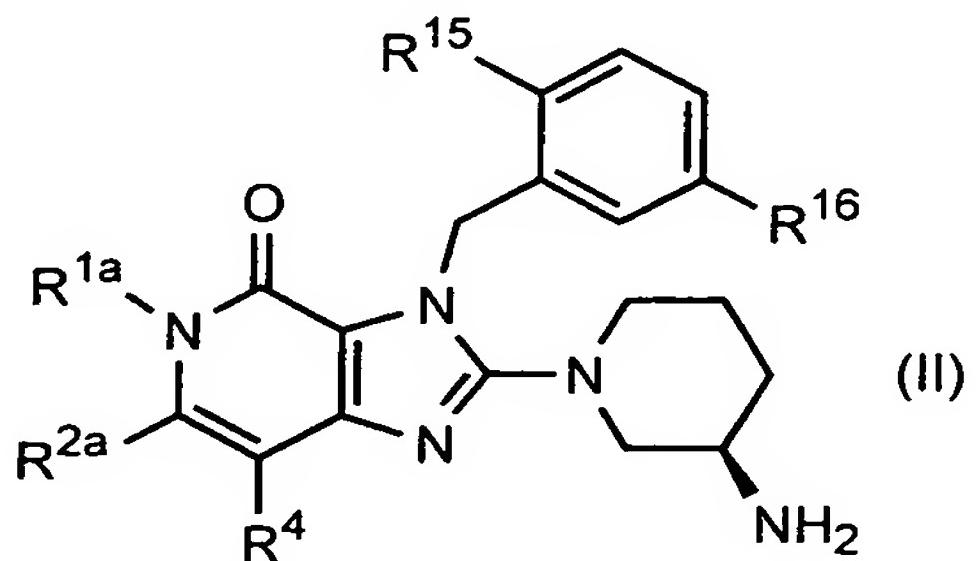
Rb is a single bond or a carbonyl group, and

Rc is an optionally substituted alkyl group, an optionally substituted alkoxy group, an optionally substituted aryl group, an optionally substituted heteroaryl group, an optionally substituted aryloxy

group or an optionally substituted heteroaryloxy group.

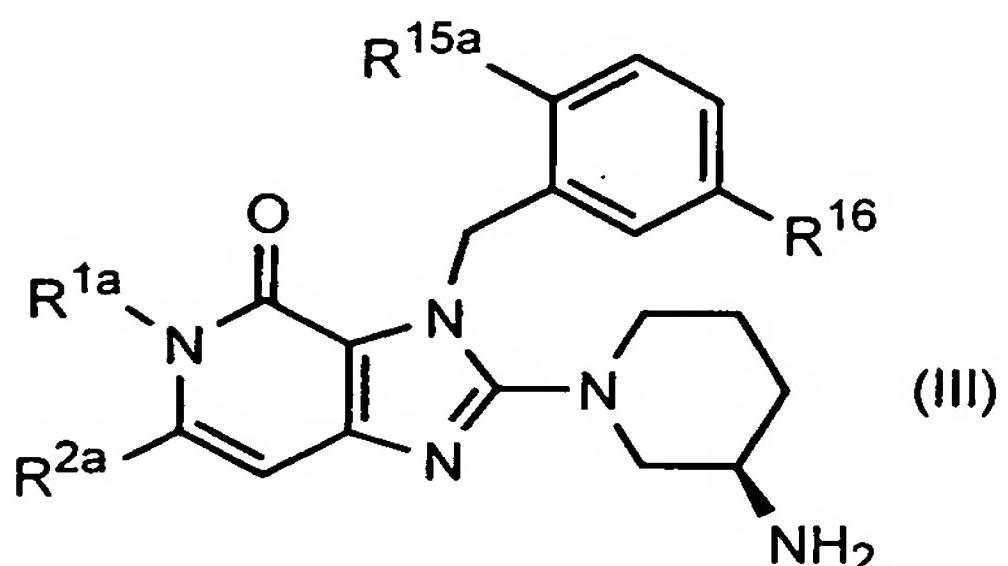
15. A compound, a prodrug thereof or a pharmaceutically acceptable salt of the compound or prodrug according to any one of claims 1 to 12, wherein R¹ is a hydrogen atom, methyl or ethyl.

16. A compound according to claim 1, which is represented by the formula (II):



wherein R⁴ is as defined in claim 1; R¹⁵ and R¹⁶ are as defined in claim 12; R^{1a} is a hydrogen atom, methyl or the formula: -Ra-Rb-Rc wherein Ra, Rb and Rc are as defined in claim 14; and R^{2a} is a cyano group, a carboxyl group, an oxazolyl group, an optionally substituted alkoxy carbonyl group, an optionally substituted cycloalkyloxycarbonyl group, a tetrahydrofuryloxy carbonyl group, an optionally substituted aryloxycarbonyl group, a cinnamyloxycarbonyl group, or a group represented by the formula: -C(O)OCH(R¹⁸)OC(O)R¹⁹ wherein R¹⁸ and R¹⁹ are as defined in claim 1,
a prodrug of said compound, or a pharmaceutically acceptable salt of said compound or prodrug.

17. A compound according to claim 1, which is represented by the formula (III):



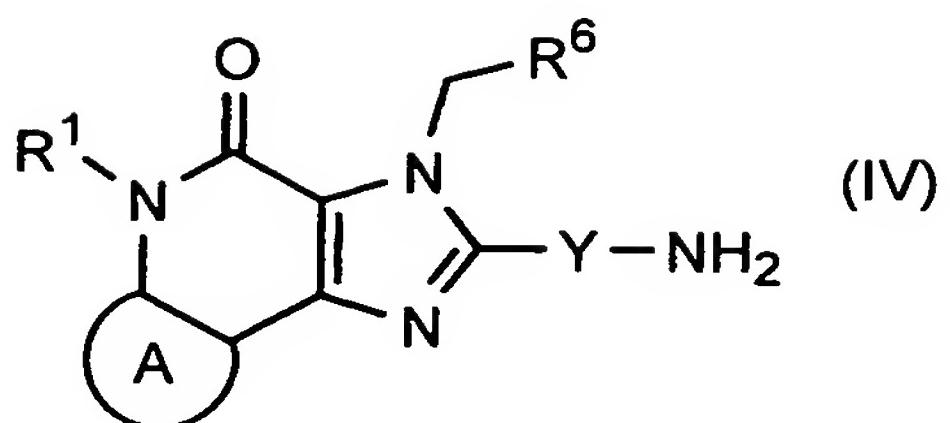
wherein R¹⁶ is as defined in claim 12; R^{1a} and R^{2a} are as defined in claim 16; and R^{15a} is a chlorine atom, a bromine atom, an iodine atom, a cyano group, methyl, difluoromethyl, trifluoromethyl, methoxy, fluoromethoxy, difluoromethoxy or trifluoromethoxy, a prodrug of said compound, or a pharmaceutically acceptable salt of said compound or prodrug.

18. A compound, a prodrug thereof or a pharmaceutically acceptable salt of the compound or prodrug according to claim 17, wherein R^{1a} is a hydrogen atom.

19. A compound, a prodrug thereof or a pharmaceutically acceptable salt of the compound or prodrug according to claim 17 or 18, wherein R^{2a} is a carboxyl group, an optionally substituted alkoxy carbonyl group, or a group represented by the formula: -

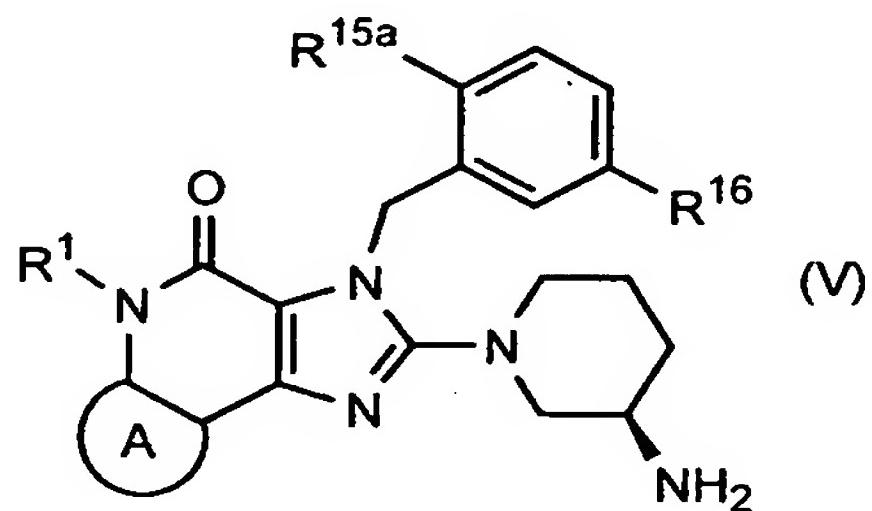
C(O)OCH(R¹⁸)OC(O)R¹⁹ wherein R¹⁸ and R¹⁹ are as defined in claim 1.

20. A compound according to claim 1, which is represented by the formula (IV):



wherein R¹, R⁶ and Y are as defined in claim 1; and the ring A is an optionally substituted benzene ring, an optionally substituted cycloalkene ring or an optionally substituted 5-or 6-membered heteroaromatic ring,
a prodrug of said compound, or a pharmaceutically acceptable salt of said compound or prodrug.

21. A compound according to claim 1, which is represented by the formula (V):

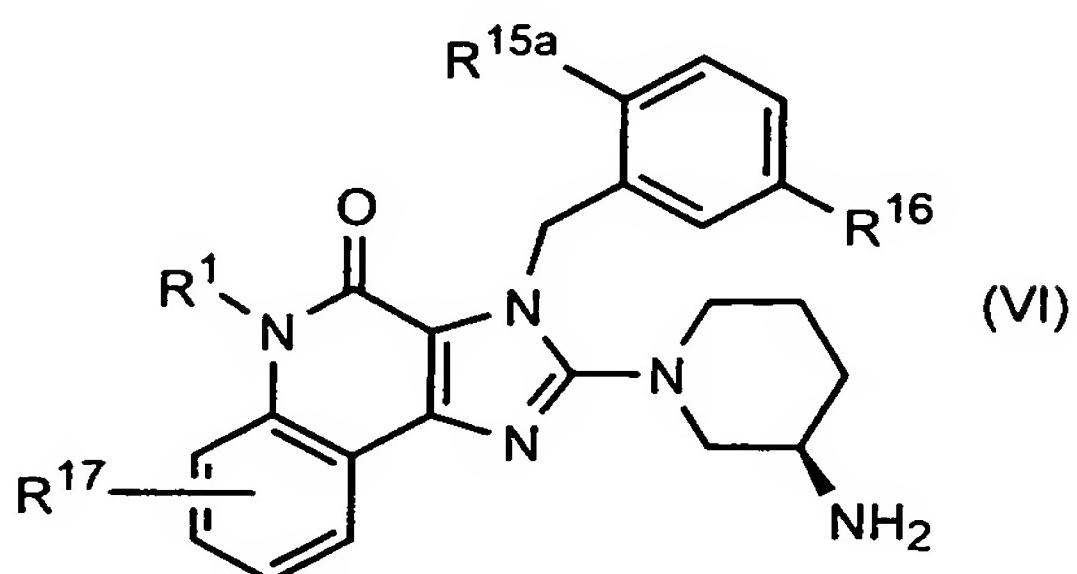


wherein R¹ is as defined in claim 1; R¹⁶ is as defined in claim 12; R^{15a} is as defined in claim 17; and A is as defined in claim 20,
a prodrug of said compound, or a pharmaceutically acceptable salt of said compound or prodrug.

22. A compound, a prodrug thereof or a pharmaceutically acceptable salt of the compound or prodrug

according to claim 21, wherein R¹ is a hydrogen atom or methyl.

23. A compound according to claim 1, which is represented by the formula (VI):



wherein R¹ is as defined in claim 1; R¹⁶ is as defined in claim 12; R^{15a} is as defined in claim 17; and R¹⁷ is absent or one to four R¹⁷'s are present and are independently a hydroxyl group, a halogen atom, a cyano group, a carboxyl group, an optionally substituted alkyl group, an optionally substituted cycloalkyl group, an optionally substituted cycloalkyloxy group, an optionally substituted alkenyl group, an optionally substituted carbamoyl group, an optionally substituted alkoxy group, an optionally substituted alkoxy carbonyl group, an optionally substituted aryloxycarbonyl group, an optionally substituted alkylcarbonyl group, an optionally substituted cycloalkyloxycarbonyl group, an optionally substituted aralkyloxycarbonyl group, a tetrahydrofuranyloxycarbonyl group, a cinnamyloxycarbonyl group, or a group represented by the formula: -C(O)OCH(R¹⁸)OC(O)R¹⁹ wherein R¹⁸ and R¹⁹ are

as defined in claim 1,

a prodrug of said compound, or a pharmaceutically acceptable salt of said compound or prodrug.

24. A compound, a prodrug thereof or a pharmaceutically acceptable salt of the compound or prodrug according to claim 23, wherein R¹ is a hydrogen atom, methyl or the formula: -Ra-Rb-Rc wherein Ra, Rb and Rc are as defined in claim 14.

25. A compound, a prodrug thereof or a pharmaceutically acceptable salt of the compound or prodrug according to claim 23, wherein R¹ is methyl.

26. A compound, a prodrug thereof or a pharmaceutically acceptable salt of the compound or prodrug according to claim 25, wherein R¹⁷ is a fluorine atom, a chlorine atom, a cyano group, a carboxyl group, acetyl, dimethylcarbamoyl, diethylcarbamoyl, methyl, ethyl, isopropyl, cyclopropyl, difluoromethyl, trifluoromethyl, methoxy, ethoxy, isopropoxy, difluoromethoxy, trifluoromethoxy, an alkoxyalkyl group optionally substituted by a halogen atom or a hydroxyl group, an optionally substituted alkoxy carbonyl group, an optionally substituted cycloalkyloxycarbonyl group, a tetrahydrofuranyloxycarbonyl group, a cinnamyloxycarbonyl group, or a group represented by the formula: -C(O)OCH(R¹⁸)OC(O)R¹⁹ wherein R¹⁸ and R¹⁹ are as defined in claim 1.

27. A compound, a prodrug thereof or a pharmaceutically acceptable salt of the compound or prodrug

according to claim 25, wherein R¹⁷ is a fluorine atom, a cyano group, a carboxyl group, an alkoxyethyl group optionally substituted by a halogen atom, an optionally substituted alkoxycarbonyl group, an optionally substituted cycloalkyloxycarbonyl group, a tetrahydrofuranyloxycarbonyl group, a cinnamyloxycarbonyl group, or a group represented by the formula: -C(O)OCH(R¹⁸)OC(O)R¹⁹ wherein R¹⁸ and R¹⁹ are as defined in claim 1.

28. A dipeptidyl peptidase IV inhibitor comprising a compound, a prodrug thereof or a pharmaceutically acceptable salt of the compound or prodrug according to any one of claims 1 to 27 as an active ingredient.

29. A pharmaceutical composition for the treatment of diabetes comprising a compound, a prodrug thereof or a pharmaceutically acceptable salt of the compound or prodrug according to any one of claims 1 to 27 as an active ingredient.

30. Use of a compound, a prodrug thereof or a pharmaceutically acceptable salt of the compound or prodrug according to any one of claims 1 to 27 in the manufacture of a dipeptidyl peptidase IV inhibitor.

31. Use of a compound, a prodrug thereof or a pharmaceutically acceptable salt of the compound or prodrug according to any one of claims 1 to 27 in the manufacture of a pharmaceutical composition for the treatment of diabetes.

32. A method for treating diabetes comprising administering an effective amount of a compound, a prodrug thereof or a pharmaceutically acceptable salt of the compound or prodrug according to any one of claims 1 to 27 to a patient who needs treatment.